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Overview of Tanjung Semeti Training Area on The VFR Corridor Path

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Abstract— **Zainuddin Abdul Madjid International Airport serves daily training flights and has a training area determined in the "Tanjung Semeti Area" where the location is also the same with the "Tanjung Semeti" checkpoint on the VFR Corridor. The purpose of this research is to review Tanjung Semeti training area to the VFR corridor path and seek solutions from potential safety risks (hazard) in that area. The research method used is a qualitative approach with data collection techniques through observation. The results of the study revealed that the same location causes VFR flight that passes through VFR corridor overlap with the training flight in the training area causing a potential safety risk for both flights. In an effort to be free from potential flight safety risks, by creating a training area at Tanjung Penggeroh or by optimizing the airspace of Sumbawa as a location for a training area will ensure the safety, efficiency and regularity of air traffic in the airspace of Zainuddin Abdul Madjid International Airport.**

Keywords— VFR corridor, training area, air traffic

I. INTRODUCTION

The world of aviation is a complex and highly coordinated system where safety takes center stage. Among the various aspects of aviation, flight training areas and visual flight routes play a critical role in ensuring the safety and efficiency of air travel. In this introductory section, it will discuss into the significance of flight training areas and their interaction with visual flight corridors, focusing on the case of Tanjung Semeti training area and the corresponding VFR corridor path.

VFR corridor is defined as airspace through Class B airspace, with defined vertical and lateral boundaries, in which aircraft may operate without an ATC clearance or communication with air traffic control [9].

Flight training area is a certain airspace over land and/or waters used for flight training [4].

Condition of a training area must meet the following conditions, namely: Ground Visual Reference Point as a reference and not over densely populated areas, high seas and/or homogeneous areas, mountainous areas, restricted airspace (prohibited area); and dangerous airspace (danger area). The condition of the surrounding air space must be within the controlled Indonesian air space (controlled airspace) or uncontrolled air space (uncontrolled airspace) and does not interfere with scheduled and non-scheduled commercial air transportation activities [4].

Zainuddin Abdul Madjid International Airport is a domestic and international airport located in Praya, Central Lombok, West Nusa Tenggara, Indonesia [5]. ATS Services (Air Traffic Service) given by Zainuddin Abdul Madjid International Airport are Aerodrome Control Service and Approach Control Service which regulates all movements of departure, Arrival, Overflying, and Local Flight with an airspace of 30 Nm with an altitude of 6,000 Ft [10].

Zainuddin Abdul Madjid International Airport also serves daily training flights for several aviation education institutions (Flying School). There are 3 (three) flying schools that have received permission to conduct daily training, namely API Banyuwangi (Banyuwangi Indonesian Aviation Academy), LIFT (Lombok Institute Flight Technology), BIFA (Bali International Flight Academy). However, while the author carried out OJT activities at Perum LPPNPU Lombok Branch Office, only LIFT (Lombok Institute Flight Technology) carried out daily flight training in the training area. Where the location of the training area is in "Tanjung Semeti Area" which is on radial 220 LMB VOR/DME as far as 10 NM with an altitude of 3,000 feet whichthe location is also the sama as the "Tanjung Semeti" checkpoint on the VFR corridor path [10].

These are the procedures for the flight training in the training area:

A. General Procedures

1. The flight school must designate a training coordinator for carry out operational coordination with the ATC on duty.
2. Flight schools must follow a predetermined schedule and flight training schedule that has been sent.
3. Clearance is given based on traffic and weather conditions.
4. Scheduled flights at the airportInternational Zainuddin Abdul Madjid was given top priority for flight training, while still paying attention to safety factors.
5. Only one trainer is permitted to occupy the training area at a time.

6. Only two training aircraft are permitted to operate, and/or fly over Zainuddin Abdul Madjid international airport area at the same time.
7. Training aircraft flying in the training area must remain within the boundary area during training.
8. Standard vertical separation between training aircraft is a minimum of 1000 feet.

B. Pre-Flight Procedures

1. Before carrying out flight training, the authorized pilot (student or instructor) must fill in the flight plan in ARO (Air Traffic Services Reporting Office) or via the e-flight plan application.
2. Flight plans can only be sent after receiving approval from ATC and receiving weather estimates around the training area from BMKG.
3. The ATC on duty can cancel the flight plan on the grounds that conditions or weather are unsafe for training aircraft activities.
4. You can stop training when flying or taxiing.

C. Procedure for Departure to training area (Tanjung Semeti)

- Runway 13

  After airborne turn right,proceed to Tanjung Semeti, climb and maintain 3000 feet or as instructed by ATC.

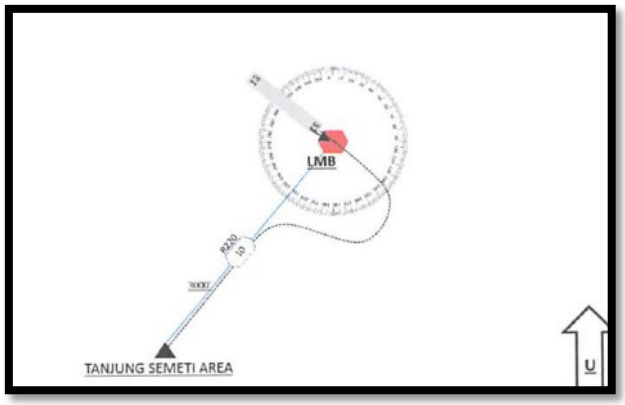

Fig 1. Departure Procedure Runway 13

- Runway 31

  After airborne turn left proceed to Tanjung Semeti, climb and maintain 3000 feet or as instructed by ATC

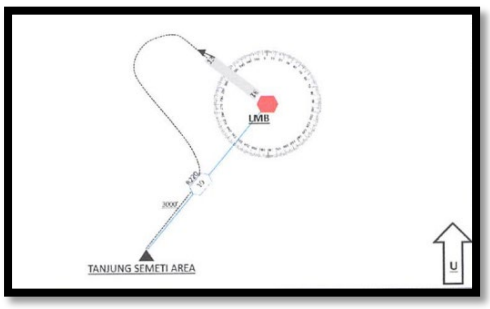

Fig 2. Departure Procedure Runway 31

D. Procedure for Arrival from training area (Tanjung Semeti)

- Runway 13

  From Tanjung Semeti follow R220 "I-MB" VOR/DME, after 5 DME, descend to circuit altitude then join right downwind 13, or as instructed by ATC.

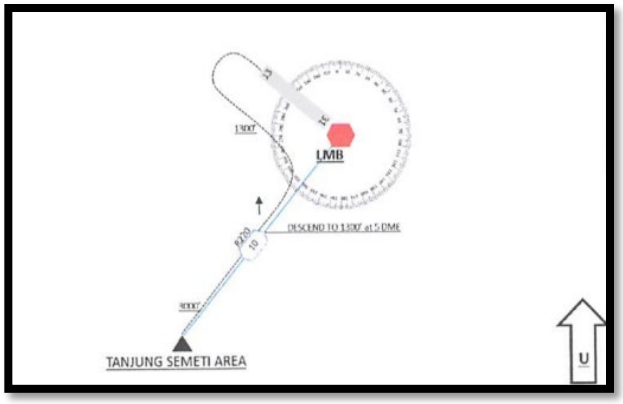

Fig 3. Arrival Procedure Runway 13

- Runway 31

  From Tanjung Semeti follow R220 "LMB" VOR/DME, after 5 DME, descend to circuit altitude then join left downwind 31, or as instructed by ATC.

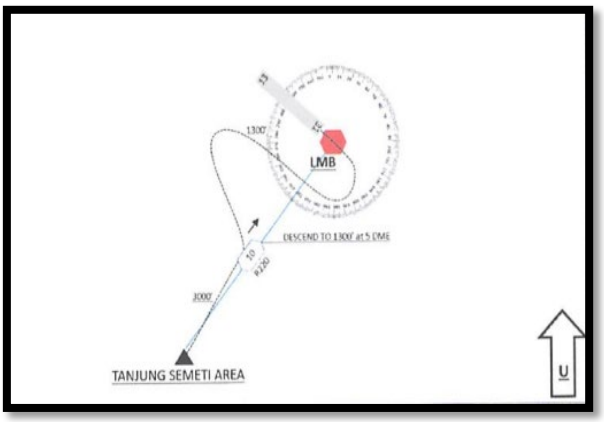

Fig 4. Arrival Procedure Runway 31

In the General of Civil Aviation Number Regulation: KP 081 year 2018 Concerning Procedures for Designating, Using and Closing Flight Training Areas Article 3 paragraph 2 letter (b), namely: The use of flight training areas cannot interfere with scheduled and non-scheduled commercial air transportation activities [4]. This regulation makes it clear that the Training Area and the VFR Corridor path cannot be in the same airspace and must be separated. safe and comfortable area for pilots to pass through.

Those same locations causes VFR flights that goes through the VFR Corridor to overlap with the training flights Which do their training in the training area causing a safety risk for both flights. A safety risk is a condition or object that has the potential to cause or contribute to an aircraft incident or accident [3]. The following are figures of the overlapping location of the Tanjung Semeti area and the VFR Corridor.

AREA	COORDINATE	RADIUS	POSITION FROM LMB VOR		RVP	BORDER				LEVEL
			DME	RDL		NORTH	EAST	SOUTH	WEST	
TANJUNG SEMETI	08° 54' 17"S 116° 10' 35"E	2 NM	10 NM	220	Tanjung Semeti	LANCING HILL	KUTA BEACH	INDIAN OCEAN	SELONG BELANAK BEACH	3000FT SFC

Fig 5. Location of Tanjung Semeti Area

Fig 6. VFR Corridor in the Zainudin Abdul Madjid International Airspace

The following is an example of a case that occurred on October 10 2022 where PK LLB a training aircraft conducted training at the Tanjung Semeti Area and PK TVP overflyed from Benete to Bali that will pass the Tanjung Semeti checkpoint. PK LLB requested a height of 3,000 feet at Tanjung Semeti and arrived at Tanjung Semeti at 01.16 UTC, at the same time PK TVP was already airborne from Benete at 01.05 UTC and arrived at Tanjung Semeti at 01.23 UTC. In order to achieve security and separation between the two aircraft, traffic information was provided and PK TVP was raised to the intended altitude of 6,000 feet beforeestimate 01.23 UTC and passed 3.000 feet at 01.10 before arriving at Tanjung Semeti. Flight Progress Strip can be seen in Figure 3. Separation between VFR Flights in airspace can become a major problem as traffic increase [11].

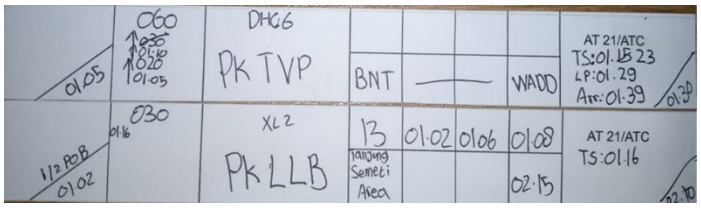

Fig 7. FPS between PK TVP and PK LLB

The research titled "Safety Risk Assessment of Air Traffic Control System Based on the Game Theory and the Cloud Matter Element Analysis" delves into an essential aspect of the air transport industry: operational safety. Over time, operational safety has stood as a paramount goal in the industry's pursuit of development and sustainability.

This study specifically emphasizes the significance of comprehensive safety evaluations, focusing on the Tanjung Semeti area. By conducting a meticulous overview of this region, the research aims to contribute significantly to addressing safety concerns within the aviation industry.

The air traffic control system plays a pivotal role in ensuring the safety of air travel, and this research employs innovative methodologies such as Game Theory and Cloud Matter Element Analysis to comprehensively assess potential risks. By utilizing these advanced analytical approaches, the study not only seeks to identify potential hazards but also aims to proactively mitigate risks that might jeopardize the safety and security of air traffic operations in the Tanjung Semeti area.

Ultimately, the research endeavors to provide valuable insights and recommendations that could substantially enhance the safety protocols and operational procedures within this critical sector. By amalgamating cutting-edge analysis techniques with a dedicated focus on a specific geographical area, the study aspires to contribute tangibly to the overarching goal of advancing safety standards in aviation, fostering sustainable growth, and ensuring a secure future for air travel. [12]

In light of the identified safety concerns arising from the interaction between the Tanjung Semeti training area and the VFR corridor, the primary purpose of this research is to provide a comprehensive overview of this critical matter. It aims to dissect the dynamics between these two entities, shed light on the inherent challenges, and propose viable solutions to address the safety risks promptly and effectively. By examining this intricate intersection, the aim of the article is to contribute to the continuous enhancement of aviation safety practices.

In the subsequent sections, we will delve deeper exploring potential solutions, and ultimately aiming to foster a safer and more efficient aviation environment.

II. METHOD

For this study, a qualitative descriptive approach has been chosen as the best way to conduct the research. This approach is a good fit when the main goal is to provide a simple and clear explanation of something.

With a qualitative descriptive approach, researchers focus on understanding the basic details. To know things who was involved, what happened, and where it all took place. This approach is great for getting a clear picture of things.

A qualitative descriptive approach needs to be the design of choice when a straight forward description of a phenomenon is desired. It is an approach that is very useful when researchers want to know, regarding events, who were

involved, what was involved, and where did things take place [6].

This research uses observational data collection techniques which are defined as the activity of recording a symptom with the help of instruments and recording it for scientific purposes or other purposes. It is further said that observation is a collection of impressions about the world around them based on all the capabilities of the human senses [7].

By adopting the qualitative approach and utilizing observational data collection, it will give a deeper understanding, and solutions. This method allows the researcher to dig beneath the surface and gain a profound understanding of the subject matter.

III. Result and Discussion

From this problem, to contribute the aim of the article of continuous enhancement of aviation safety practices and to fulfill the objectives of air traffic services namely Security, Safety, Efficiency, and Regularity of civil aviation [1] [2]. The author provides two solutions to solve the problem, namely:

A. Make a new training area at Tanjung Penggeroh.

The author suggest making a new Training area in Tanjung Penggeroh because the location is not in the VFR corridor path and does not interfere with the movement of departure and arrival aircraft that uses runway 13 and 31. Based on the calculations that have been done by the author using Google Earth Pro, Tanjung Penggeroh is located on radial 250 as far as 18 NM from LMB VOR/DME.

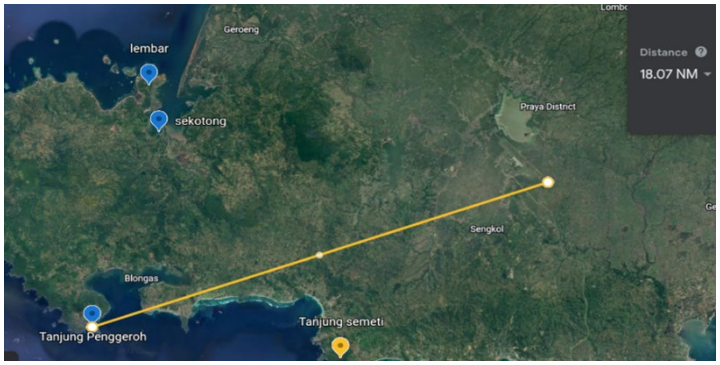

Fig 8. Location of Tanjung Penggeroh from LMB VOR/DME

Fig 9. Location of Tanjung Penggeroh outside of the VFR Corridor path

B. Sumbawa airspace is optimized for training area activities.

The oversight of the Sumbawa and Bima regions by the Lombok Branch of Perum LPPNPI presents an opportunity to optimize the Sumbawa airspace for flight training purposes. Given the relatively low volume of flight movements in this area, the authors propose relocating the training area to Sumbawa. This strategic move aims to facilitate safe, smooth, and comfortable flight training activities.

The suggestion involves a procedural approach to airspace management, leveraging the concept of splitting operational sectors. In aviation, the division or splitting of operational sectors is a method employed to increase airspace capacity. By segmenting airspace volumes into smaller operational sectors, the overall capacity can be augmented without necessitating substantial technological alterations. [13]

This strategy aligns with the principle that smaller operational sectors, although handling reduced absolute traffic levels compared to larger sectors, can effectively manage higher traffic density. Therefore, while the overall traffic volume might decrease in smaller sectors, their capacity to accommodate more intensive traffic density enables capacity enhancements.

The relocation of flight training to the Sumbawa area, with its relatively low flight movements, aligns with this approach. By segmenting the airspace and designating specific areas for training purposes, the proposal aims to optimize the use of available airspace resources. This not only supports the smooth execution of flight training activities but also contributes to the overall enhancement of airspace capacity without requiring significant technological alterations.

IV. Conclusion

The conclusion that can be drawn from the problem described is, by making a training area in Tanjung Penggeroh or the Sumbawa Airspace optimized for training area activities. With these two solutions, it will maximize safety, smooth of air traffic, and security for flights in the airspace of Zainuddin Abdul Madjid International Airport.

We are going to the next generation of safety challenges that require the development and understanding of new forms of data to improve safety in other segments aviation, and moving from a reactive, incident-based approach toward a more proactive, predictive, and systems-based approach [8]. With this overview of Tanjung Semeti Area, it answers the aim to contribute enhancement of aviation safety practices and a new approach of moving into a proactive way to overcome safety challenges.

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